



Standard Operating Procedure

Equipment / Procedure:	<i>Tekscan Pressure Sensors (F-scan)</i>
Filename:	<i>2013.1014SOP_tekscan_pressure_sensors</i>
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Tekscan Pressure Sensors (F-scan)

Safety Information:

- *You should read the operators manual or get one-to-one training with the device and insoles before using this equipment in a test situation.*
- *User Manuals are kept in the ABS store cupboard. Please see a member of staff.*
- *Please discuss and confirm with the participant that they do not have any pain or discomfort from wearing the F-Scan sensors.*
- *Ensure that the F-Scan sensor is firmly secured to the participant or object under analysis, the **VersaTek 2-Port Hub** must be safely placed on a table or on the floor and the Ethernet cable should be long enough not to impede any of the subject's movements.*

General Information:

1. *Make sure you are using a computer (or laptop for field work) with the last version of the F-scan software. To use two F-Scan systems in parallel on the same computer; a specific software version has to be installed, namely; F-Scan Research 6.62. F-Scan software is compatible with the following Microsoft Windows Operating Systems, namely; Win 2000 (SP4), Win XP (SP2) or Win Vista.*
2. *Make sure you have the sensor **Model #3000E** (VersaTek). The sensors should be in good condition with no evident crinkles or folds and should be good to use up to seven times, however more than 5 is highly unlikely, depending on the test conditions. The sensors can be easily trimmed to the desired shape and size with scissors, depending on your application, as explained in the manual.*
3. *Take the trimmed sensors, the VersaTek 2-Port Hub, two VersaTek Cuffs and cables (1 USB cable and 2 Ethernet cables) out of their case. The sensors have to be handled with care, paying attention not to fold or crease them. For general insole applications, you will find fitting information in the manual. Where more specific applications are required, such as where they are to be worn on the body (i.e. shoulders).*
4. *Connect the VersaTek 2-Port Hub to a power source, switch on the computer, connect the VersaTek 2-Port Hub via the USB port (USB3 ports are recommended) and make sure that the operating system has recognised the device (if speakers are on a sound can be heard shortly after having connected the USB port). Connect the Ethernet cables in channel port (CH1 & CH2) of VersaTek 2-Port Hub with the respective VersaTek Cuff ports and then connect the sensors to the cuffs (carefully). Remember that both the sensors have to be connected to the cuffs to record an acquisition.*
5. **NB – Triggering:** *VersaTek 2-Port Hub can be triggered (if required) by an external device (both IN and OUT trigger ports are available on VersaTek 2-Port Hub). A BNC cable is needed to connect the VersaTek 2-Port Hub trigger port with an external device. Remember to select “Enable Triggering” in the Option Menu and follow the instructions in the manual to set Triggering Parameters.*

6. **NB – Calibration.** *The reliability of the measure is dependent on the calibration used. Make sure asking a member of the staff which calibration (default Tekscan or custom calibrations) has to be performed for specific experimental conditions (walking, running, or high dynamic loading). Procedures for default Tekscan calibrations are explained in the manual.*

Where special “custom” calibration of the insoles is needed such as in shoulder pressure measurements of rugby players during a scrum; please consult the technical note “Time-based calibrations of pressure sensors improve the estimation of force signals containing impulsive events” which can be found with the technician.

Acquiring Data – Operation:

1. *Start the F-Scan software and follow the instruction/procedures written in the manual for data acquisition. Remember that sensors have to be calibrated before each testing session.*
2. **NB – data saving:** *make sure you have created a dedicated folder for your data. This can be done through the toolbar, using “New Patient Button”. Create a new one, inserting “FIRST NAME” and “LAST NAME” and potentially date of birth as the date of the acquisition session. Be sure to select your “Patient” (in the toolbar “Patients” button) before recording the pressure data. Ideally data should be saved (“cut & paste”) on your personal storage device once the experiment is finished.*
3. **NB – reliability:** *the quality of the measure is dependent on acquisition duration (because of sensor drift), interface materials, sensor type, magnitude of the load range and loading profile. A proper calibration is fundamental to have reliable and accurate measures (ask a member of staff about this for more information)*
4. **NB – troubleshooting 1:** *it may happen that a cuff or handle connection error pops up before or during an acquisition session. In this case, cross check all the Ethernet cable connections and start another acquisition. If this connection error is still present and / or the system freezes and / or does not allow access to the main functions:*
 - (i) *Close the F-Scan Software*
 - (ii) *Disconnect the USB cable*

(iii) *Disconnect the power cable of the VersaTek 2-Port Hub, and start again from point 4. It could just be that the connection error pops up but the data will still be recorded.*

5. **NB – troubleshooting 2:** *Where recording two sets of VersaTek 2-Port Hubs and sensor pairs is necessary on the same computer; the “New Recording” button has to be pressed once to activate the recording on the first VersaTek 2-Port Hub and twice to activate the recording on the second VersaTek 2-Port Hub.*

6. **Shut down procedure:**

- *Exit the software.*
- *Shut down the computer.*
- *Disconnect the USB cable.*
- *Disconnect the power supply from the VersaTek 2-Port Hub.*
- *Store sensors, VersaTek 2-Port Hub, VersaTek Cuff and cables in their case.*

Additional Notes:

Ensure that the sensors are in good condition after the acquisition session and put them back in their dedicated box. Make a note on the box to log that they have been used. This will help to inform the next user of the sensor’s usage history.

Installation, maintenance and calibration:

- *The Tekscan F-Scan system is a portable system, made up of many components, so attention has to be paid both in the transportation and use of the equipment so that none of its elements gets damaged or lost.*
- *The hardware as such should not itself require any calibration unless it is sent back to the factory for repair or service.*

- *Ensure that the equipment carries a valid “electrically safety tested” sticker (tag) which should be clearly dated before using the system with participants.*

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